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Endovascular repair for an extracranial internal carotid aneurysm with cervical access: A case report

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ABSTRACT

BACKGROUND: Carotid aneurysms are a rare pathology. This vascular disorder can be asymptomatic or it can cause local compression. The disorder poses a high risk of embolization and rupture.
PRESENTATION OF CASE: A 79 years old female, presents with a right internal carotid fusiform aneurysm, approximately 3.8 cm in diameter, localized 3.30 cm from the common carotid artery bifurcation with an extremely tortuous common carotid artery.
DISCUSSION: Surgical management of the extracranial internal carotid artery remains varying and challenging, particularly with a distal internal carotid aneurysm and with anatomical difficulties.
CONCLUSION: Endovascular management of an internal carotid aneurysm with cervical access using an expanded polytetrafluoroethylene covered stent with Heparin Bioactive Surface in the carotid area, is safe and effective.

1. Introduction

Carotid aneurysms are a rare pathology, with an incidence of 0.4–4% of all aneurisms [1–3]. Occurrence of isolated aneurysms of the extracranial internal carotid artery (EICA) is even more rare. This vascular disorder can be asymptomatic or it can cause local compression. The disorder poses a high risk of embolization and rupture [4,5].

Surgical management of EICA remains varying and challenging [6]. Furthermore, when a distal internal carotid aneurysm and with an extremely tortuous common carotid artery, it is particularly difficult to use an open surgical or an endovascular approach.

2. Presenting concerns

The subject of this report is a 79-year-old white, married, non-drinking, non-smoking female, with hypertension, no history of trauma or surgery, who presents with a pulsatile cervical mass.

3. Clinical findings

A pulsatile retromandibular mass with systolic bruit in the right neck. The patient was evaluated by neurology department with a National Institute of Health Stroke Scale (NIHSS) = 0 and Rankin modified score = 0.

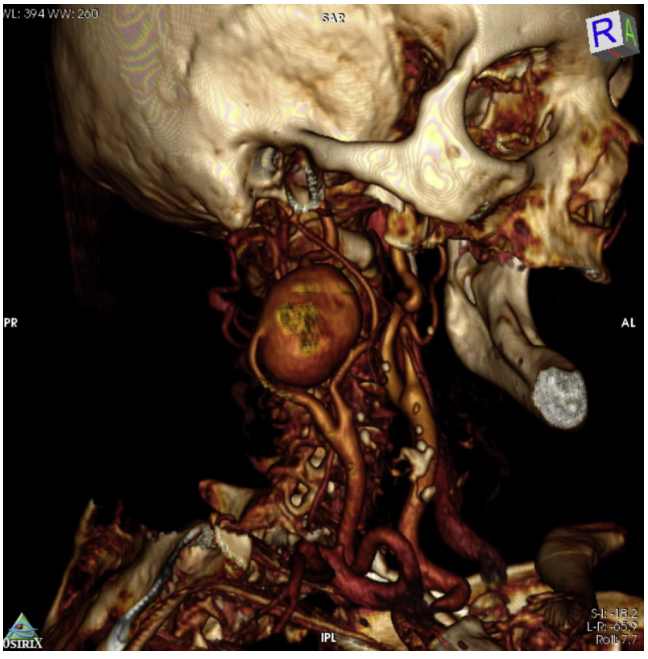

Fig. 1. Computed tomography: with right internal carotid fusiform aneurysm and the extremely tortuous of the common carotid artery.

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4. Diagnostic focus and assessment

The computed tomography shows a right internal carotid fusiform aneurysm of approximately 3.8 cm in diameter, localized 3.30 cm from the common carotid artery bifurcation with an extremely tortuous common carotid artery (Fig. 1).

5. Therapeutic focus and assessment

With an appropriate inform consent, we took the patient to a hybrid operating room. The procedure was performed with the patient under general anesthesia and endotraqueal intubation.

The right common carotid artery was exposed through a 3 cm length incision in the anterior edge of the sternocleidomastoid muscle at the low neck. An 8 French introducer sheath (Avanti®) was inserted in the common carotid artery (Fig. 2), and 5000 Units of heparin was injected through the sheath. An angiography was performed (Fig. 3A and C). The internal carotid artery was canalized distal to the aneurysm with the cerebral emboli protection system (Filterwire EZ®) and was deployed just before the carotid siphon. The expanded polytetrafluoroethylene (ePTFE) covered stent with Heparin Bioactive Surface (Gore® VIABAHN® Endoprosthesis with Propaten® Bioactive Surface) was introduced and placed in the right position. A control angiography was performed with excellent results (Fig. 3B and D) and the cerebral protection system was removed.

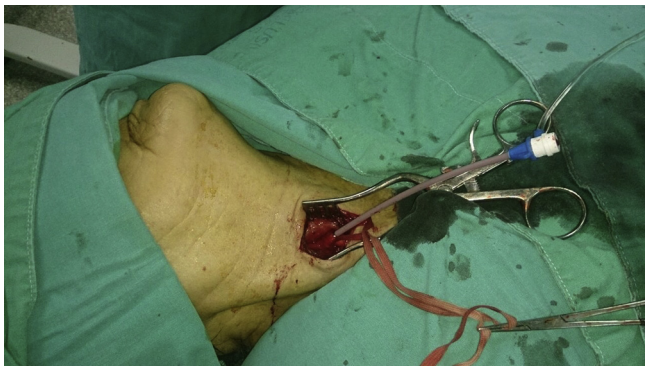

Fig 2. Surgical approach with a 3 cm incision; 8 French introducer sheath in the common carotid artery.

The day after, the patient was evaluated by the same neurologist resulting in a NIHSS = 0, and the patient was discharged the same day.

6. Discussion

Extracranial internal carotid aneurysms are extremely rare, most of them are asymptomatic, but have a potential in neuro-

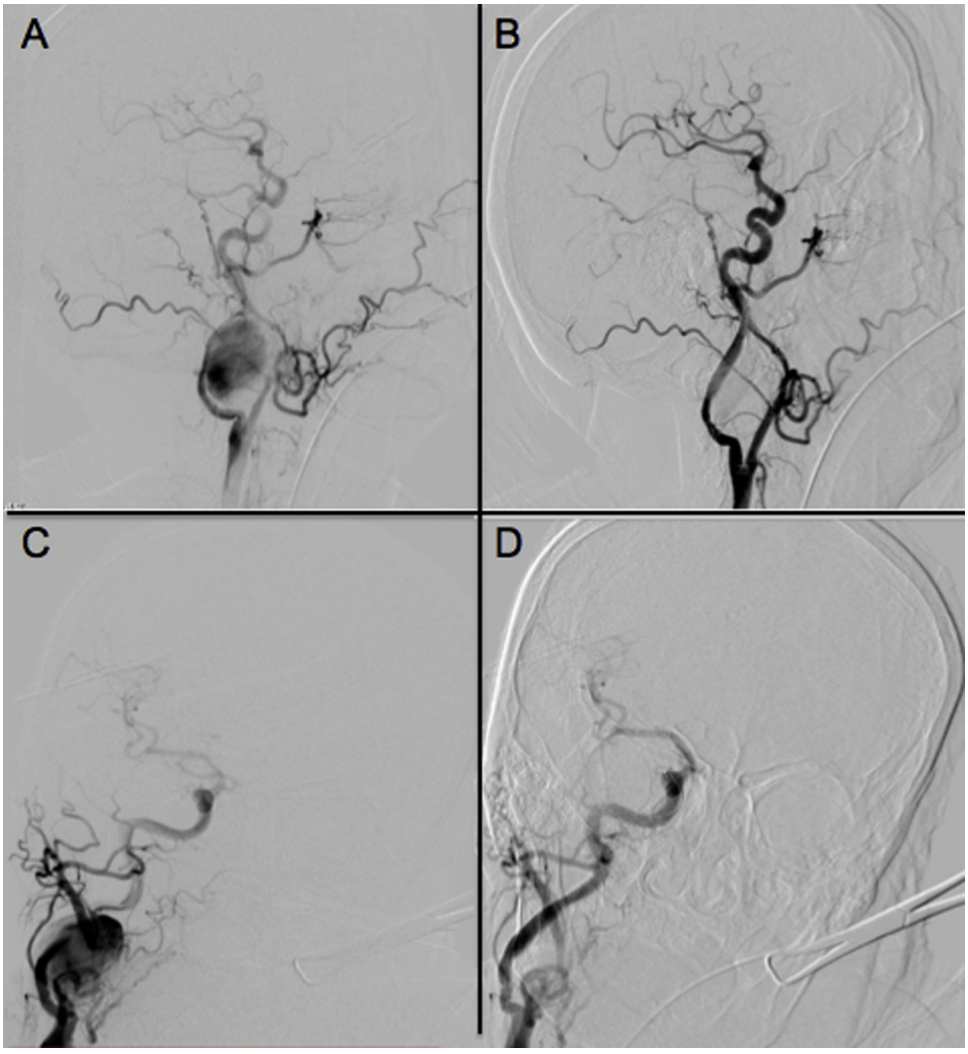

Fig 3. A and C: angiography, right internal carotid fusiform aneurysm. B and D: control angiography after stenting.

logic morbimortality [6]. Historically the treatment is open surgical resection and reconstruction [7–9].

According to etiology, aneurysms can be classified as atherosclerotic, post-traumatic, dissecting or mycotic (infected) aneurysms or those associated with cystic medial necrosis, Marfan's syndrome and fibromuscular dysplasia. Other rare causes include tuberculosis, Takayasu's arteritis and human immunodeficiency virus-related arteritis [10].

The treatment of this kind of aneurysms presents a challenge for the vascular surgeon, even more when they are distal to the common carotid bifurcation that makes a difficult open surgery approach and with extremely tortuous common carotid artery or unfavorable aortic arc anatomy, that makes endovascular reach of the lesion impossible.

This case suggests that cervical access for the endovascular exclusion of an internal carotid aneurysm with ePTFE-covered stent with Heparin Bioactive Surface is an effective and safe procedure for the management of this pathology, especially with anatomical difficulty. This technique reduces operative time and makes a less hazardous dissection. This case represents an off-label use.

7. Conclusion

We report an endovascular management procedure of an internal carotid aneurysm with cervical access, and we demonstrate that the use ePTFE-covered stent with Heparin Bioactive Surface in carotid area is safe and effective.

Patient consent

The patient provided written permission for the publication of this case report.

Conflict of interest

Dr. Ignacio Rivera-Chavarría and Dr. Juan C. Alvarado-Marín have no conflict of interest.

Consent

We appropriate obtained written consent from the patient before the procedure.

Author contribution

Dr. Ignacio Rivera-Chavarría: Principal surgeon, writing the paper, final approval Dr. Juan C. Alvarado-Marín: asssist the surgery, final approval.

Guarantor

Dr. Ignacio Rivera-Chavarría and Dr. Juan C. Alvarado-Marín.

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